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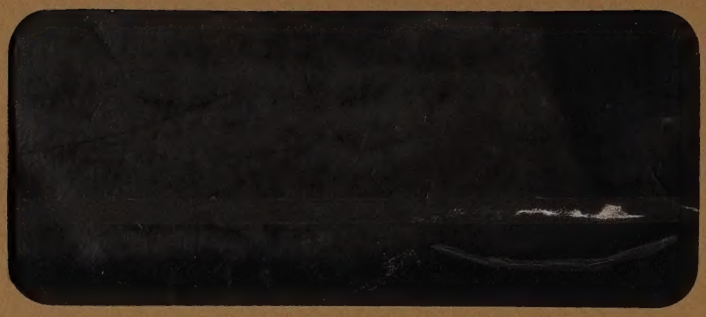
MANUAL OF OPERATION

MODEL 3000D



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  - ( ) TDM & MODEM TEST SETS AND PRINTERS.
  - ( ) REMOTE SWITCHING OF DATA LINES.
  - ( ) DATA TRAP AND DATA LINE MONITORING.
  - ( ) POLLING TESTERS.
  - ( ) EIA INTERFACE BREAKOUT MONITORS.
  - ( ) V.35 INTERFACE BREAKOUT MONITORS.
  - ( ) BELL 301/303 INTERFACE BREAKOUT MONITORS.
  - ( ) SPECIFICALLY, IDS MODELS _____
  - ( ) HAVE A SALESMAN CALL.
  - ( ) SEND CATALOG.

INTERNATIONAL DATA SCIENCES, INC.

ADVANCED TECHNIQUES IN DATA COMMUNICATIONS

MANUAL OF OPERATION

MODEL 3000D

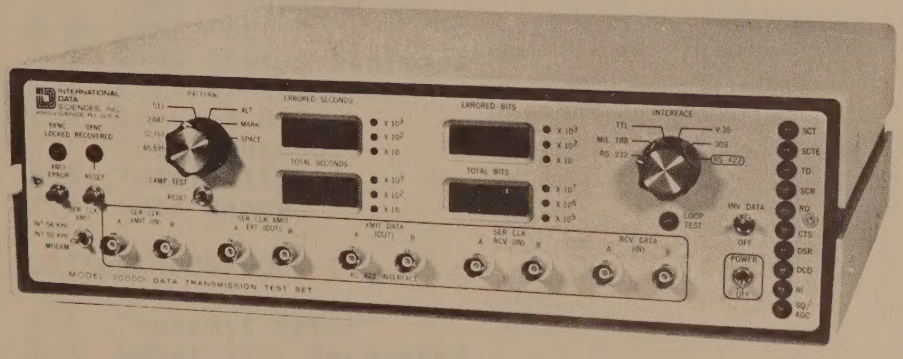

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TABLE OF CONTENTS

1.0 INTRODUCTION & GENERAL DESCRIPTION

1.1 High Speed
1.2 Six Interfaces
1.3 Full-Duplex Operation
1.4 Bit-Error Rate
1.5 Errored-Seconds Rate
1.6 Interface Display
1.7 Test Patterns

2.0 INDICATOR LAMPS & DISPLAY DESCRIPTION

2.1 Sync Locked
2.2 Sync Recovered
2.3 Loop Test
2.4 Line Status Monitors
2.5 Errored Seconds
2.6 Errored Bits
2.7 Total Seconds
2.8 Total Bits
2.9 Over Range

3.0 CONSOLE CONTROLS

3.1 Transmit Error
3.2 Reset Sync Recovered
3.3 Pattern
3.4 Interface
3.5 Reset/Lamp Test
3.6 Invert Receive Data
3.7 Serial Clock Transmit
3.8 Power

4.0 THEORY OF OPERATION

4.1 Transmitter and Receiver Operation
4.2 Fast Loss-of-Sync Detection

5.0 INPUT/OUTPUT SIGNAL SPECIFICATIONS

5.1 EIA RS-232
5.2 MIL 188
5.3 TTL
5.4 CURRENT
5.5 V.35
5.6 EIA RS-422
5.7 2900D Printer

TABLE OF CONTENTS (continued)

6.0 REAR PANEL DESCRIPTION

- 6.1 AC Line Connector
- 6.2 Line Voltage Select Switch
- 6.3 Fuse
- 6.4 Interface Connectors
- 6.5 Model 2900D Printer
- 6.6 Loop Back Plug Storage

7.0 SELF TEST

8.0 MECHANICAL SPECIFICATIONS

9.0 OPTIONS

- 9.1 Selectable Serial Clock Transmit Option

CALIBRATION AND REPAIR SERVICE

TROUBLE REPORT

WARRANTY

LIST OF FIGURES

Figure 2.0-1 Model 3000D Front and Rear Panel Line Drawing

Figure 2.0-2 Model 3000D Front and Rear Panel Photo

Figure 4.0 Typical Data Communication System

Figure 5.1 EIA Modem-Terminal Interface Decal

Figure 9.1 Model 3000-D Front and Rear Panels Supplied with the Selectable Serial Clock Transmit Option

1.0 INTRODUCTION & GENERAL DESCRIPTION

The Model 3000D Data Transmission Test Set represents the latest state-of-the-art equipment for high speed synchronous testing of data communication channels. Included in this single, compact, portable unit, are many new and useful features.

Repeating pseudo-random bit patterns, shown theoretically to be the optimum signals for testing digital data communications channels, are generated and transmitted by the transmitter section and received and compared with a true replica in the receiver section. A 65,535-bit pseudo-random pattern is utilized for testing the new 50KHz and 56KHz high speed data circuits. This pattern generates random data at these speeds for more than a second before repeating itself, thus providing a statistically random data stream. In addition, an all-new proprietary technique, allows a loss-of-synchronism to be detected with such speed that the error counts are relatively unaffected.

1.1 High Speed

The Model 3000D is designed to operate at any synchronous modem speed up to 5 MHz/sec. In addition, it has two built-in clocks, 50 KHz and 56 KHz, for testing those special modems requiring an external clock source.

1.2 Six Interfaces

Six interfaces have been built into the unit to provide maximum flexibility. All are switch selectable and all are accessed through separate connectors. They are: The new RS-422 - this interface can operate in both the single or double-ended mode; Current - for testing Bell 301 and 303 type modems; V.35 - this interface operates in the balanced mode and is used to test Bell 306 type modems; EIA RS 232; MIL 188; and TTL.

1.3 Full-Duplex Operation

The unit contains separate transmitter and receiver sections and thus is capable of operating in the simplex, half-duplex, or full-duplex modes.

1.4 Bit-Error Rate

A running count of the data bits received in error is presented on a separate 3-digit, LED display automatically scaled by a factor of 10, 10^2, or 10^3. In addition, a running count of the number of data bits received is presented on a separate 3-digit, LED display automatically scaled by a factor of 10^5, 10^6, or 10^7. (The Total Bits counter starts its display at 1 x 10^4 bits). Thus, the running BIT ERROR RATE = (TOTAL BITS IN ERROR)/(TOTAL BITS RECEIVED) is constantly displayed.

1.5 Errored-Seconds Rate

A running count of the errored-seconds received is presented on a separate 3-digit LED display automatically scaled by a factor of 10, 10^2, or 10^3. An errored-second is defined as a block of data, one second in duration, containing one or more errors. By means of a separate 3-digit Total Seconds display, automatically scaled by a factor of 10, 10^2, or 10^3, a running count of the elapsed time in seconds is obtained. Thus, the total errored-seconds and the Errored-Seconds Rate = (Total Errored Seconds)/(Total Elapsed Seconds), is constantly displayed.

1.6 Interface Display

The status of ten key signals at the interface selected by the Interface switch on the front panel, are monitored and displayed by means of 10 LED monitors located on the front panel. The signals monitored are: SCT (Serial Clock Transmit), SCTE (Serial Clock Transmit External), TD (Transmit Data), SCR (Serial Clock Receive), RD (Receive Data), CTS (Clear To Send), DSR (Data Set Ready), DCD (Data Carrier Detect), RI (Ring Indicator), and SQ/AGC (Signal Quality or Automatic Gain Control).

1.7 Test Patterns

Six test patterns may be selected by a front panel switch. Three of these test patterns are pseudo-random patterns and three are not. The length of the three pseudo-random patterns are 2047-, 32,767-, and 65,535-bits. The other three patterns are Space, Mark, and Alternate. All patterns are transmitted at the transmitter clock rate. The 65,535-bit pseudo-random test pattern has been provided for testing the new 50 Kbit and 56 Kbit data communication links. At those speeds, the 65,535-bit pattern repeats itself every 1.3 or 1.2 seconds, respectively, thus insuring that the test bit-patterns are statistically truly random in nature.

2.0 INDICATOR LAMPS & DISPLAY DESCRIPTION

A line drawing of the front and rear panels showing all of the indicator lamps and controls is shown in Figure 2.0-1. A photograph of the front and rear panels is shown in Figure 2.0-2.

2.1 Sync Locked

This indicator is illuminated whenever the analyzer section of the test set is generating a pattern in phase with the pattern received on the received data line. Bit, character, or block error and mark-to-space transition detection is performed only when this light is illuminated.

2.2 Sync Recovered

This lamp when illuminated, indicates that the receiver had detected a loss of synchronization during the test and had automatically resynchronized and continued the error analysis.

2.3 Loop Test

This indicator is illuminated whenever the Loop Test plug is connected to one of the interface connectors on the rear panel. When this plug is inserted into an interface connector the Model 3000D is in the self-test mode.

2.4 Line Status Monitors

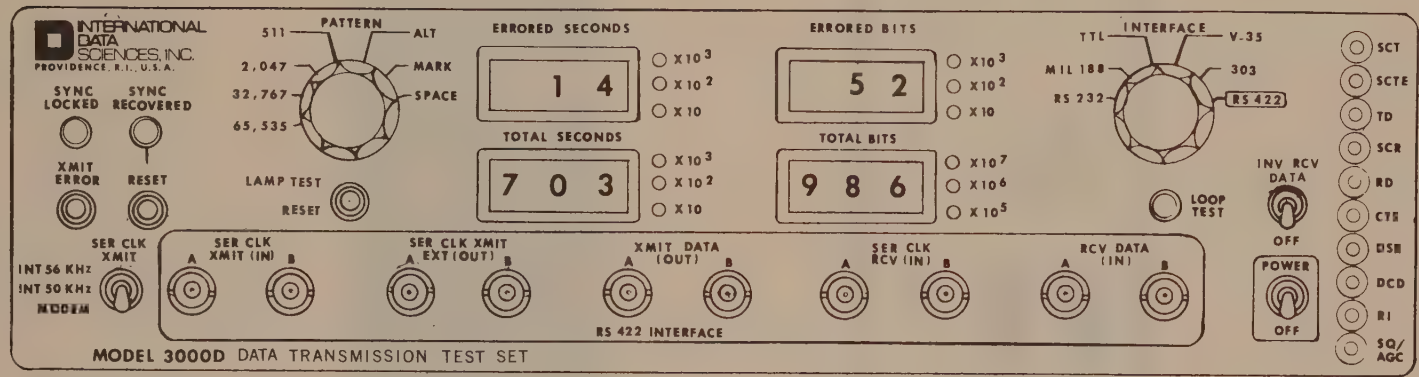
Ten key signals of the interface are continuously monitored; they are SCT, SCTE, TD, SCR, RD, CTS, DSR, DCD, RI, and SQ/AGC. All LEDs are illuminated for the Space or On condition at the selected interface.

2.5 Errored Seconds

A 3-digit display of the running errored-seconds count. All zeros to left of most significant digit are suppressed except the units zero. Three LED indicators automatically multiply display contents by a factor of 10, 10^2, or 10^3.

2.6 Errored Bits

A 3-digit LED display of the running bit error count. Count is advanced each time a data bit in error is received. All zeros to left of the most significant digit are suppressed except the units zero. Three LED indicators automatically multiply display by a factor of 10, 10^2, 10^3.



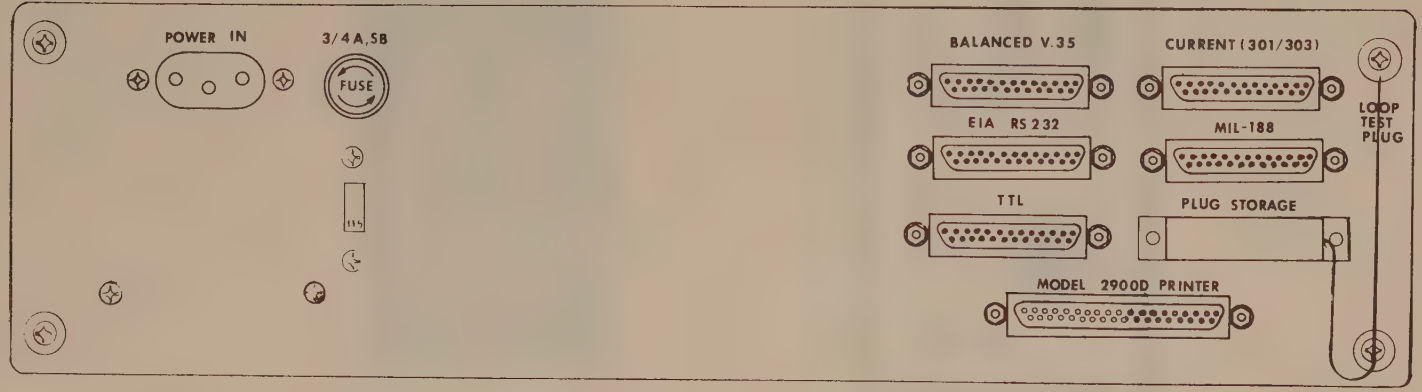


FIGURE 2.0-1 MODEL 3000D FRONT AND REAR PANEL LINE DRAWING

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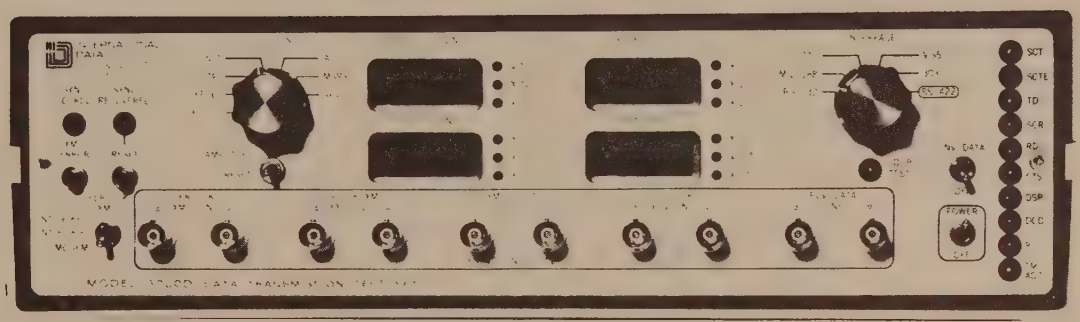


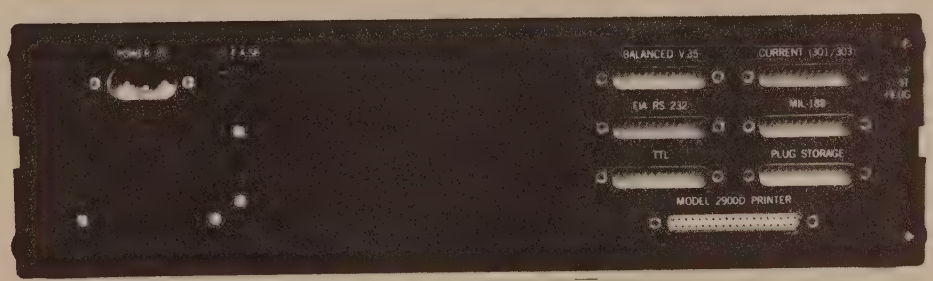


FIGURE 2.0-2 MODEL 3000D FRONT AND REAR PANEL PHOTO

2.7 Total Seconds

A 3-digit display of the running total of elapsed seconds. All zero's to left of most significant digit are suppressed except the units zero. Three LED indicators automatically multiply display by a factor of 10, 10^2, or 10^3.

2.8 Total Bits

A 3-digit display of the running total of bits received. The internal counter is advanced each time a bit is received. All zero's to the left of the most significant digit are suppressed except the units zero. Three LED indicators automatically multiply the display by a factor of 10^5, 10^6, or 10^7. The display remains at zero for the first 1×10^4 bits counted. The count is displayed starting with the next bit received.

2.9 Over Range

When a counter exceeds its capacity, the count continues but its display will slowly blink until reset.

3.0 CONSOLE CONTROLS

3.1 Transmit Error

A pushbutton which inserts a single error in the transmitted pseudo-random data pattern each time it is depressed.

3.2 Reset Sync Recovered

A pushbutton which resets and extinguishes the Sync Recovered storage circuit and LED.

3.3 Pattern

A seven-position switch selects the data pattern generated by the transmitter section and appears as the Xmit Data Out signal. Also selects the data pattern generated by the receiver section and compared with the data signal appearing at the Rcv Data In input. The seven-positions are labeled: Space, Mark, Alt, 511, 2047, 32767, 65535. The last four positions select the length, in bits, of four pseudo-random patterns. Bit errors and errored seconds are detected only when pseudo-random patterns are selected.

3.4 Interface

A 6-position rotary switch which selects the proper interface for the Model 3000D. The six selections are: RS 422, 303, V.35, TTL, MIL 188, and RS 232.

3.5 Reset/Lamp Test

This three-position toggle switch has two functions; when switched to the Reset position it will reset all counters and force a resync condition. When switched to the Lamp Test position, it will illuminate all segments of each display and also illuminate all front panel LEDs.

3.6 Invert Receive Data

A two-position switch which when set to the Invert Receive Data position causes the Receive Data signal to be inverted on all interfaces.

3.7 Serial Clock Transmit

A three-position switch allowing operator to supply Ser Clk (In) either internally at 50KHz or 56KHz, or externally by the modem.

3.8 Power

A two-position switch which energizes and resets the unit.

4.0 THEORY OF OPERATION

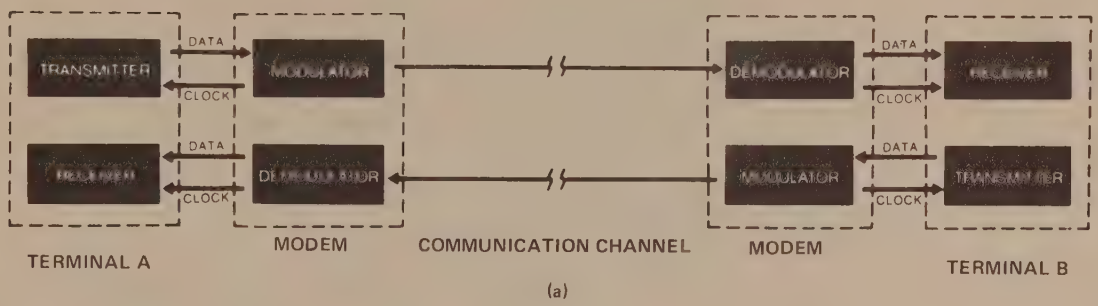
The following is a step-by-step procedure for operating and testing a Model 3000D Data Transmission Test Set. Figure 4.0 shows a typical full-duplex system to be tested. The system consists of two pieces of business equipment located at terminals A and B, communicating with one another by means of two full-duplex modems and a channel. Data being transmitted from Terminal A to Terminal B is completely independent of each other.

4.1 Transmitter and Receiver Operation

The Receiver will generate a pure replica of the pseudo-random patterns generated by the Transmitter. The receiver synchronizes itself automatically with the transmitted bit pattern and, once in sync, begins a bit-by-bit comparison. If an error is detected, the Bit Error Counter will be advanced by one. An Errored Seconds counter is advanced once each time one or more errors has occurred in a one-second period. Two additional counters recording Total Seconds and Total Bits are advanced for each respective event. All counters have auto-ranging and upon overrange will continue to count but blink slowly. The counters can be reset manually by means of the spring loaded reset switch on the front panel or automatically from the Model 2900D Printer.

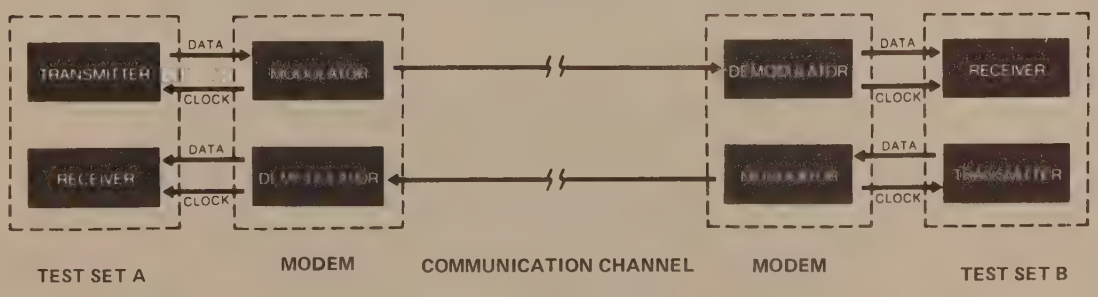
4.2 Fast Loss-of-Sync Detection

The Model 3000D incorporates for the first time in any data transmission test set, a new, unique, and proprietary (Patent Pending) technique for the rapid detection of loss of synchronization. The commonly used method of detecting a loss of synchronization between the received pseudo-random data pattern, with errors, and the locally generated error-free replica pattern, is to determine the running error-rate, and if the error-rate equals one-half the data rate over a finite period of time, then it is assumed that the patterns are out of synchronization and skewed with respect to one another. This method is perfectly valid but unfortunately, the error-count prior to the Loss-of-Sync is invalidated, since several thousand bits are required to make a reliable decision. The IDS method utilizes an entirely different mathematical criteria whereby the loss-of-sync condition is determined quickly thus allowing the running error count to be relatively unaffected by any loss of synchronization. The occurrence of a loss of sync is stored and displayed on the front panel, and may be reset by the operator.



(a)

TYPICAL TEST SET APPLICATION



(b)

FIGURE 4.0 Top Diagram is a typical Digital Data Communication system.
Bottom Diagram shows this system under Test utilizing two Data Test Sets.

5.0 INPUT/OUTPUT SIGNAL SPECIFICATIONS

5.1 EIA RS 232 INTERFACE

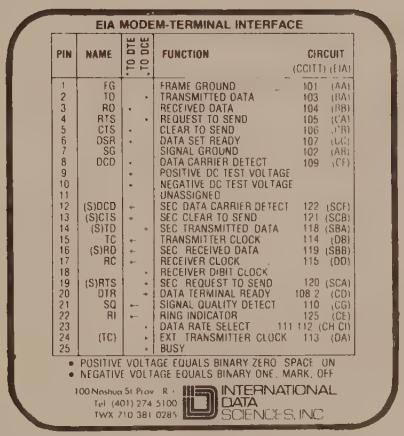
Utilizes standard 25 conductor EIA cable with Cinch-Jones DB25S and DB25P connectors. An EIA Modem-Terminal interface decal is shown in Figure 5.1.

Interface Output Drivers

Levels	-	±6 ±0.5 volts
Binary one	-	-6V ±0.5 volts
Binary zero	-	+6V ±0.5 volts
Impedance	-	Less than 100 Ω for Data and clock signals. Less than 1000 Ω for control signals.
Control Signals On, Space	-	+12V ±1 volt
Control Signals Off, Mark	-	-12V ±1 volt
Protection	-	All outputs protected against circuits to +25 volts, -25 volts, or ground.

Interface Input Receivers

Binary one	-	-2 volts to -25 volts
Binary zero	-	+2 volts to +25 volts
Impedance	-	3000 Ω to 7000 Ω
Noise Immunity	-	±2 volts with hysteresis
Protection	-	±25 volts without damage to receiver circuits.



EIA MODEM-TERMINAL INTERFACE

PIN	NAME	TO DTE	TO DCE	FUNCTION	CIRCUIT (CCITT)	(EIA)
1	FG			FRAME GROUND	101	(AA)
2	TD		•	TRANSMITTED DATA	103	(BA)
3	RD	•		RECEIVED DATA	104	(BB)
4	RTS		•	REQUEST TO SEND	105	(CA)
5	CTS	•		CLEAR TO SEND	106	(CB)
6	DSR	•		DATA SET READY	107	(CC)
7	SG			SIGNAL GROUND	102	(AB)
8	DCD	•		DATA CARRIER DETECT	109	(CF)
9		•		POSITIVE DC TEST VOLTAGE		
10		•		NEGATIVE DC TEST VOLTAGE		
11				UNASSIGNED		
12	(S)DCD	←		SEC DATA CARRIER DETECT	122	(SCF)
13	(S)CTS	←		SEC CLEAR TO SEND	121	(SCB)
14	(S)TD		→	SEC TRANSMITTED DATA	118	(SBA)
15	TC	←		TRANSMITTER CLOCK	114	(DB)
16	(S)RD	←		SEC RECEIVED DATA	119	(SBB)
17	RC	←		RECEIVER CLOCK	115	(DD)
18			•	RECEIVER DIBIT CLOCK		
19	(S)RTS		→	SEC REQUEST TO SEND	120	(SCA)
20	DTR		→	DATA TERMINAL READY	108.2	(CD)
21	SQ	←		SIGNAL QUALITY DETECT	110	(CG)
22	RI	←		RING INDICATOR	125	(CE)
23			•	DATA RATE SELECT	111.112	(CH.CI)
24	(TC)		→	EXT TRANSMITTER CLOCK	113	(DA)
25			→	BUSY		

• POSITIVE VOLTAGE EQUALS BINARY ZERO, SPACE, ON
• NEGATIVE VOLTAGE EQUALS BINARY ONE, MARK, OFF

FIGURE 5.1 EIA MODEM-TERMINAL INTERFACE DECAL

5.2 MIL-STD-188 INTERFACE

Utilizes standard 25-conductor EIA cable with Cinch-Jones DB25S and DB25P connectors.

Interface Output Drivers

Levels	-	±6V ±0.5 volts
Data Binary one	-	±6V ±0.5 volts
Data Binary zero	-	-6V ±0.5 volts
Impedance	-	Less than 100 Ω for Data and clock signals. Less than 1000 Ω for control signals.
Control Signal On, Space, Zero	-	+12V ±1 volt
Control Signal Off, Mark, One	-	-12V ±1V
Protection	-	All outputs protected against short circuits to -25 volts, +25 volts, or ground.

Interface Input Receivers

Data Binary one	-	+0.6 volts maximum
Data Binary zero	-	-0.6 volts maximum
Impedance	-	6000 Ω minimum
Noise Immunity	-	±0.6 volts with hysteresis
Protection	-	±25 volts without damage to receiver circuits.

5.3 TTL INTERFACE

Utilizes standard 25 conductors EIA cable with Cinch-Jones DB25S and DB25P connectors.

Interface Output Drivers

Levels	-	Zero to 3 volts
Binary one	-	4V ±1 volt
Binary zero	-	0V ±0.4 volts
Impedance	-	100 Ω ±5%
Protection	-	Outputs protected against short circuits to ground.

Interface Input Receivers

Binary one	-	4V ±1 volt
Binary zero	-	0V ±0.4 volts
Impedance	-	1000 Ω ±5%
Protection	-	-1.5 volts to +5.5 volts without damage to receiver circuits.

5.4 303 CURRENT INTERFACE

Utilizes special 15 conductor cable with Cinch-Jones DB25S and Burndy MD12MXP-17TC connectors.

Interface Output Drivers

Binary one, Mark, Off - A current less than 5 ma into a 100Ω load.

Binary zero, Space, On - A current greater than 23 ma into a 100Ω load.

Interface Input Receivers

Binary one, Mark, Off - A current less than 5 ma

Binary zero, Space, On - A current greater than 20 ma

Impedance - 100Ω ±5%

Open circuit - Receiver assumes an off or mark-hold condition.

5.5 BALANCED CCITT V.35 INTERFACE

Utilizes special 25 conductor cable with Cinch-Jones DB25S and Continental 25034-16PSKH-C connectors. All control signals conform to EIA RS 232 specifications.

Interface Output Drivers

Levels	-	±1.1V +0.1 volt
Impedance	-	100Ω ±1% balanced. 150Ω ±1% with respect to ground with outputs A and B shorted together.
Binary One	-	Output A negative with respect to output B.
Binary Zero	-	Output A positive with respect to output B.
Rise and Fall Time	-	Greater than 40 nsec when measured between 10% to 90% of waveform rise or fall time.
DC Offset	-	0V ±0.2 volts for each output with respect to ground.
Protection	-	Outputs protected against short circuits to ground or to each other.

Interface Input Receivers

Sensitivity	-	±10 millivolts maximum
Impedance	-	100Ω ±1%
DC Resistance	-	150Ω ±1% with respect to ground with inputs A and B shorted together.
DC Offset	-	±0.6 volts maximum
Protection	-	±10 volts maximum without damage to receiver circuits.

5.6 EIA RS-422 INTERFACE

Utilizes front panel BNC connectors labeled A and B: Balanced (A and B) or single ended (A or B).

Interface Output Drivers

Levels	-	±5V ±0.5 volts differential. ±2.5V ±0.25 volts single ended.
Impedance	-	100Ω ±1% differential. 50Ω ±1% single ended.
Binary One, Mark, Off	-	Output A negative with respect to output B.
Binary Zero, Space, On	-	Output A positive with respect to output B.
Rise and Fall Time	-	Greater than 20 nsec when measured between 10% to 90% of waveform rise or fall.
DC Offset	-	0V ±0.5 volts differential. 0V ±0.25 volts single ended.
Protection	-	Outputs protected against short circuits to ground or to each other. Short circuit current limited to 150 ma.

Interface Input Receivers

Sensitivity	-	±200 mv maximum balanced. ±400 mv maximum single ended.
Impedance	-	4000Ω minimum balanced. 2000Ω minimum single ended.
DC Offset	-	±7 volts maximum for proper operation.
Protection	-	±15 volts maximum without damage to receiver circuits.

5.7 2900D Printer

Logic has been added to the Model 3000D to allow it to operate with the IDS Model 2900D Printer when testing communication channels. The Model 2900D provides a hard copy of test results and is especially meaningful during long periods of unattended testing. The Printer plugs into the rear panel connector labeled Model 2900D Printer. Signal names and description are listed in the following table labeled Printer Connector Signals.

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PRINTER CONNECTOR SIGNALS

Pin #	Signal Name	Signal Flow	Description
1	Not Used		
2	Errored Seconds	To Printer	A negative going pulse 5 usec in duration for each detected Errored Second.
3	Receive Clock	To Printer	A normally low signal which goes high when the receiver clock input to Model 3000D is absent.
4	BCD bit 8 hundreds digit	To Printer	BCD data output of either Errored Seconds, Total Seconds, Errored Bits, or Total Bits. The output selected is controlled by printer input commands as described on Pins 26, 27, 28, and 29 of this connector. These outputs are negative true. A five-volt signal is a logic zero and a zero-volt signal is a logic one.
5	" " 4 " "	" "	
6	" " 1 " "	" "	
7	" " 2 " "	" "	
8	BCD bit 4 tens digit	" "	
9	" " 8 " "	" "	
10	" " 1 " "	" "	
11	" " 2 " "	" "	
12	BCD bit 4 units digit	" "	
13	" " 8 " "	" "	
14	" " 2 " "	" "	
15	" " 1 " "	" "	
16	BCD Data Autorange bit 1	To Printer	Negative true BCD coded autorange data. 00 = No power of 10 01 = BCD output times 10 10 = BCD output times 100 11 = BCD output times 1000 For Total bits 00 = BCD output times 10^4 01 = BCD output times 10^5 10 = BCD output times 10^6 11 = BCD output times 10^7
18	BCD Data Autorange bit 2	" "	
17	Reset Count	From Printer	A high to low pulse resets all the displays' counters.
19	Sync Recovered	To Printer	Normally high (5V) signal which goes low (0V) when Model 3000D recovers sync.
20	Not Used		
21	Signal Ground		
22	Not Used		

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Pin #	Signal Name	Signal Flow	Description
23	Not Used		
24	In Sync	To Printer	Normally high (5V) signal to indicate that Model 3000D is in sync. This signal goes low when the Model 3000D is out of sync.
25	Frame Ground		
26	Errored Seconds Select	From Printer	A high requests Errored Second BCD Data at output connector.
27	Total Seconds Select	From Printer	A high requests Total Bits BCD Data at output connector.
28	Errored Bits Select	From Printer	A high requests Errored Bits BCD Data at output connector.
29	Total Bits Select	From Printer	A high requests Total Bits BCD Data at output connector.
30	Receive Data (RD)		normally high, goes low if no RD is detected
31	Clear to Send (CTS)		normally high, goes low if no CTS is detected
32	Data Set Ready (DSR)		normally high, goes low if no DSR is detected
33	Serial Clock Transmit(SCT)		normally low, goes high if no SCT is detected
34	Signal Quality/ Automatic Gain Control (SQ/AGC)		normally low, goes high if no SQ/AGC is detected
35	Ring Indicator (RI)		normally low, goes high if no RI is detected
36	Data Carrier Detect (DCD)		normally high, goes low if no DCD is detected
37	Not Used		

6.0 REAR PANEL DESCRIPTION

6.1 AC Line Connector

AC Power applied via this three-prong connector. Mates with Belden Line Cord # 17258.

6.2 Line Voltage Select Switch

Selects either 115V 60 Hz or 230V 50 Hz for test set operation.

6.3 Fuse

3/4 A Slow Blow

6.4 Interface Connectors

Five 25-pin connectors allow for interfacing the modem and the Model 3000D.

6.5 Model 2900D Printer

This connector interfaces the Model 3000D with the Model 2900D for hard copy data storage.

6.6 Loop Back Plug Storage

A Loop Back connector is supplied with the Model 3000D for self-test capability. When the test set is not in the self-test mode, this plug is inserted into Plug Storage.

7.0 SELF -TEST

The 3000D can be self-tested in any of the six interface modes simply by plugging the loop test plug into the desired interface. The Model 3000D should be disconnected from the communication equipment during loop test. When in the loop test configuration, the following test procedure can be used to determine proper operation of the Model 3000D.

1) a) Insert Loop Back Plug into EIA RS 232 input on rear penel.
   b) Set the front panel switches to the following positions:

   a) Ser Clk Xmit - Int 56 KHz
   b) Pattern - 65,535
   c) Interface - RS 232
   d) Inv Data - Off
   e) Power - Off

2) a) Set Power Switch On
   b) Hold Lamp test toggle switch up.
      Note: All front panel lamps and all Display segments are on.

3) Release Lamp test toggle switch.
   Note: a) Sync Locked, Loop Test, and all Channel monitor lamps on extreem right hand side of Model 3000D are on.
   b) Total seconds counter is advancing.
   c) Total Bits counter is advancing.

4) Depress and release Xmit Error Switch (not more than once every two seconds)
   Note: a) The Errored Seconds and Errored Bits displays are advanced by one each time this switch is actuated.

5) Hold Reset switch down.
   Note: a) All display counters are reset to Ø.

6) Set Pattern Switch to 32,767
   Note: a) Sync Locked Lamp is on.
   b) Sync Recovered Lamp is on.

7) Depress and release Reset Sync Recovered.
   Note: a) Sync Recovered Lamp is off.

8) Set Pattern Switch to 2047
   Note: Sync Locked Lamp is on.

9) Set Pattern Switch to 511
   Note: Sync Locked Lamp is on.

10) Set Pattern Switch to ALT
   Note: Sync Locked Lamp is off.

11) Set Pattern Switch to Mark
   Note: TD Lamp is off.

12) Set Pattern Switch to Space
   Note: TD Lamp is on.

7.0 SELF-TEST (continued)

This Self-Test can be used on each interface simply by selecting the desired interface on the front panel and inserting the Loop Back connector into the appropriate input receptacle. The Loop Back connector is not used to test the RS 422 interface.

To Test this interface, it is necessary to leave the Loop Back connector in its storage location and to use the front panel BNC for Self-Test loop around.

Connect Ser Clk Xmit Ext (out) A & B to Ser Clk Xmit (in) and Ser Clk Recv (in) A & B respectively. Connect Xmit Data (out) A & B to Rcv Data (in) A & B the RS 422 interface can now be tested using the test procedure previously described.

8.0 MECHANICAL SPECIFICATIONS

8.1 Size

13 7/8" (35.2 cm) D x 14 3/4" (37.4 cm) W x 4 1/2" (11.4 cm) H

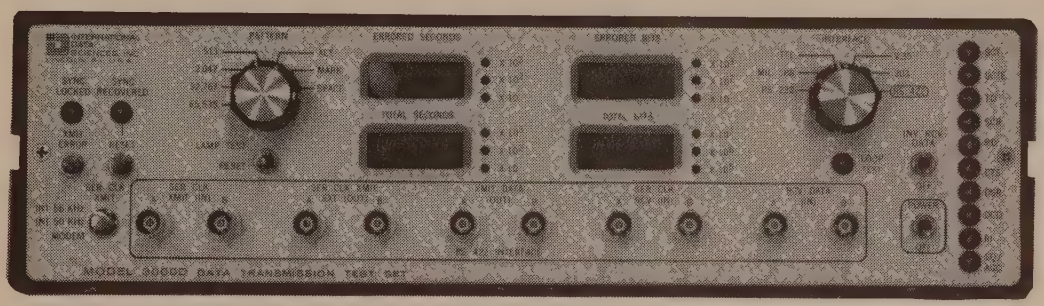
8.2 Weight

19 pounds (3.6 Kg)

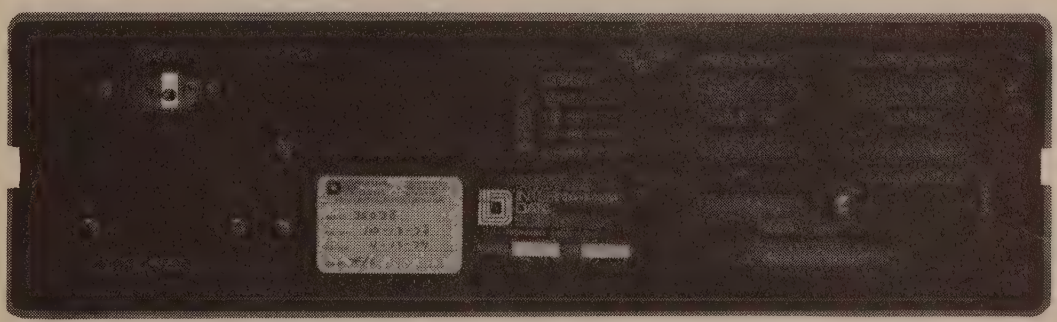
9.0 OPTIONS

9.1 Selectable Serial Clock Transmit Option

This option supplies additional serial clock data rates of 64 KHz and 32 KHz to the Model 3000D. This option is provided by disabling the front panel Serial Clock Transmit switch and replacing it with a five-position, rear panel rotary switch as shown in Figure 9.1.



FRONT



REAR

FIGURE 9.1. MODEL 3000-D FRONT AND REAR PANEL SUPPLIED WITH THE SELECTABLE SERIAL CLOCK TRANSMIT OPTION

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CALIBRATION AND REPAIR SERVICE

All units sold by International Data Sciences, Inc. are calibrated at the time of delivery. International Data Sciences, Inc. recommends a periodic calibration every six months thereafter performed by the Calibration Department at International Data Sciences, Inc. Contact IDS for the cost of each calibration. If the unit requires repairs that are not covered by the original warranty, then IDS will perform the repair at an hourly charge plus parts. Normal turn-around time for calibration is two weeks.

Equipment so calibrated will bear a gummed label on the rear panel identifying the serial number of unit calibrated; the date of calibration; the next recommended calibration date; and the in-plant calibrator identifier.

All units returned to IDS for calibration will be accepted only if transportation charges are prepaid. The purchaser is also responsible for all transportation charges incurred in returning the calibrated unit to the purchaser.

For fast service Federal or Emery Air Freight are recommended. If time is not a problem, UPS is recommended. Return address should be clearly stated and should include a person to the attention of whom unit will be shipped.

Shipping cartons with proper foam packing are available from IDS. The carton will facilitate shipping the equipment to be calibrated with a maximum of protection.

For most expeditious service, when returning the equipment for repair, please fill out the Trouble Report in your manual of operation.

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MODEL 3000D TROUBLE REPORT

1) Please indicate what positions the following switches were in.

PATTERN	INTERFACE	SER CLK XMIT
__65,535 __ALT	__RS232 __V.35	__INT 56KHz
__32,767 __MARK	__MIL188 __303	__INT 50KHz
__ 2,047 __SPACE	__TTL __RS422	__MODEM
__ 511		

INV DATA

__ON
__OFF

2) Please check only the lamps that were on.

__SYNC LOCKED	__SCT	__SCR	__DSR	__SQ/AGC
__SYNC RECOVERED	__SCTE	__RD	__DCD	
__LOOP TEST	__TD	__CTS	__RI	

ERRORED SECONDS	TOTAL SECONDS	ERRORED BITS	TOTAL BITS
__X10^3 __X10	__X10^3 __X10	__X10^3 __X10	__X10^3 __X10
__X10^2	__X10^2	__X10^2	__X10^2

3) Please draw or give a description of how the test set was being used. Describe connector used, equipment type, and malfunction of test set or system. (Use back of page if additional room is needed)

4) Please give name, address, and telephone number of the person to contact about this unit.

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MODEL 3000D TROUBLE REPORT

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__ 2,047 __SPACE	__TTL __RS422	__MODEM
__ 511		

INV DATA

__ON
__OFF

2) Please check only the lamps that were on.

__SYNC LOCKED	__SCT	__SCR	__DSR	__SQ/AGC
__SYNC RECOVERED	__SCTE	__RD	__DCD	
__LOOP TEST	__TD	__CTS	__RI	

ERRORED SECONDS	TOTAL SECONDS	ERRORED BITS	TOTAL BITS
__$X10^3$ __X10	__$X10^3$ __X10	__$X10^3$ __X10	__$X10^3$ __X10
__$X10^2$	__$X10^2$	__$X10^2$	__$X10^2$

3) Please draw or give a description of how the test set was being used. Describe connector used, equipment type, and malfunction of test set or system. (Use back of page if additional room is needed)

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__ 2,047 __SPACE	__TTL __RS422	__MODEM
__ 511		

INV DATA

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__OFF

2) Please check only the lamps that were on.

__SYNC LOCKED	__SCT	__SCR	__DSR	__SQ/AGC
__SYNC RECOVERED	__SCTE	__RD	__DCD	
__LOOP TEST	__TD	__CTS	__RI	

ERRORED SECONDS	TOTAL SECONDS	ERRORED BITS	TOTAL BITS
__$X10^3$ __X10	__$X10^3$ __X10	__$X10^3$ __X10	__$X10^3$ __X10
__$X10^2$	__$X10^2$	__$X10^2$	__$X10^2$

3) Please draw or give a description of how the test set was being used. Describe connector used, equipment type, and malfunction of test set or system. (Use back of page if additional room is needed)

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__ 2,047 __SPACE	__TTL __RS422	__MODEM
__ 511		

INV DATA

__ON
__OFF

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__SYNC LOCKED	__SCT	__SCR	__DSR	__SQ/AGC
__SYNC RECOVERED	__SCTE	__RD	__DCD	
__LOOP TEST	__TD	__CTS	__RI	

ERRORED SECONDS	TOTAL SECONDS	ERRORED BITS	TOTAL BITS
__$X10^3$ __X10	__$X10^3$ __X10	__$X10^3$ __X10	__$X10^3$ __X10
__$X10^2$	__$X10^2$	__$X10^2$	__$X10^2$

3) Please draw or give a description of how the test set was being used. Describe connector used, equipment type, and malfunction of test set or system. (Use back of page if additional room is needed)

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INTERNATIONAL DATA SCIENCES, INC.

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WARRANTY

All International Data Sciences, Inc. instruments are warranted against defects in material, workmanship and component failures for a period of ninety days and against defects in material and workmanship for a period of one year. All units returned to IDS under this warranty require prepaid transportation charges. The purchaser is also responsible for all transportation charges incurred in returning the repaired unit to the purchaser.

Instruments to be returned under this Warranty require prior authorization by an International Data Sciences, Inc. representative or by the service manager of International Data Sciences, Inc.

International Data Sciences, Inc. reserves the right to make changes in design at any time without incurring any obligation to install same on units previously purchased.

This Warranty is expressly in lieu of all other obligations or liabilities on the part of International Data Sciences, Inc., and International Data Sciences, Inc. neither assumes nor authorizes any person to assume for them any other liability in connection with the sales of International Data Sciences, Inc. instruments.

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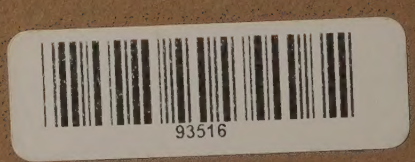

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